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seismic safety element

of the Claremont general plan



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207 HARVARD AVENUE (714) 624-4531 CLAREMONT 91711 DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

July 15, 1974

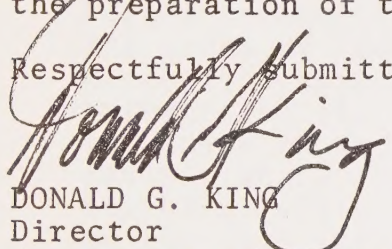
Honorable Mayor and City Council
Claremont, California

Members of the City Council:

The staff is pleased to submit the Seismic Safety Element to the General Plan as amended and adopted on 11 June 1974 by Council Resolution No. 74-164.

This Element was developed with substantial participation and assistance by members of the community and the Claremont Colleges. Without the efforts and support of these active participants a different product would certainly have resulted. With this Element as adopted policy, the staff will now begin the preparation of the means to implement these policies.

Respectfully submitted,


DONALD G. KING
Director

Department of Planning & Community Development

DGK:deb
att.

City planning Claremont
Emer. relief Earthquakes "

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SEISMIC SAFETY ELEMENT

XI. Seismic Safety Element

The Seismic Safety Element is intended to identify and appraise seismic hazards which are a potential threat to the public, and to contain policies which will serve as guidelines for an implementation program that will seek to minimize those potential hazards. The policies contained in the Element will consider potential injuries and loss of life, damage to property, as well as economic and social disruption. The task of addressing seismic hazards is complicated by the fact that earthquakes and their resultant effects are both unpredictable and infrequent.

In order to gather and evaluate most effectively the geologic and seismic characteristics of Claremont, the City contracted with Fugro, Inc., Consulting Engineers and Geologists, for the preparation of a geotechnical report and map.¹ The data provided in this report, along with information provided to the City by advisors in the Geology Department of Pomona College and other informed citizens of the community during public hearings, form the basis for the policies contained in the Seismic Safety Element and the implementation program that will follow.²

The study of Claremont's geology and seismology indicates that the City's position is similar to that of many other Southern California communities, particularly those in Los Angeles County to the south of the San Gabriel Mountains, in that it has similar geologic conditions, has had a limited history of seismic disturbance on its local faults, and lies within close proximity to the major known faults such as the San Andreas and San Jacinto faults, which faults do present a threat of a major earthquake to Southern California communities. The geotechnical data submitted to the City indicates the following areas for consideration:

1. Severe and intense ground shaking resulting from a large earthquake on the San Andreas or the San Jacinto fault systems.
2. A moderate to large earthquake on the frontal fault system along an east-west zone at the southern edge of the San Gabriel Mountains. If the earthquake occurs outside the City, the effect would be similar to a major event on the San Andreas system. If the event occurs within the City, shaking could be accompanied by ground rupture.
3. Renewed activity on one or more of the three noted faults within the City or activity on other now unrecognized faults

1. The consultant's report is referenced at the end of the General Plan Document and the geotechnical map is appended to this Element.
2. A letter from the geologists in the Geology Department of Pomona College, which summarizes their interpretation of geologic and seismic risk in Claremont, is referenced in the General Plan.

within the City, which have the potential for both ground shaking and ground rupture.

4. The existence of landslide and debris flows in the hillsides which are subject from minor to major failure. This failure is likely in strong earthquake shaking, especially if the ground is water soaked.

In addition to these potentially hazardous geologic conditions, this Element is also concerned with structures which are potentially hazardous in the event of a significant seismic disturbance. A preliminary survey attempting to identify potentially hazardous structures has been conducted by the City, with the assistance of the Los Angeles County Department of Engineering, to serve as a basis for assessing the extent of this potential hazard. The survey consisted of a visual external inspection of commercial, industrial, educational, public, and some miscellaneous buildings throughout the City. The survey was limited to structures that were built prior to 1933, the year that seismic design for buildings was made a requirement of the Building Code.

Seismic Risk

In formulating policies that pertain to potential seismic hazards, it is necessary to consider many factors, including the amount and quality of the geotechnical data available, an evaluation of the degree of risk which the City is willing to accept, the limitations that can and/or should be placed on future development, and the economic and social implications which these limitations might have. The best data available indicates that the community as a whole faces virtually the same degree of hazard from an earthquake with the exception of the hillsides which face the additional hazard of landslide and debris flows. While it is generally agreed that Claremont has three local faults, there is a lack of agreement regarding the amount of activity that has occurred on these faults. The evidence indicates that no movement has occurred in the last 11,000 or more years. There is also lack of consensus on the precise location of the faults due to the fact that the faults are located beneath a thick alluvial deposit; the location has been established primarily through the study of ground water barrier data. In addition, the location of surface rupture associated with movement on these faults will not necessarily occur along the fault lines on the geotechnical map. Given the amount of uncertainty regarding earthquakes irrespective of source, it can be concluded that the risk associated with local faults are less significant than the threat of an earthquake caused by known active faults that are some distance from the City.

The policies set forth in this Element are an attempt to develop the appropriate planning response to the risk of potential seismic hazard. There is no such thing as a perfectly hazard free environment and the potential threat of earthquakes has been made clear to residents of Southern California. Natural and man-made hazards

of varying types and degrees are always present. Whether or not a risk is acceptable depends upon the nature of the risk. For something like seismic risk which is not voluntary, it is appropriate for government agencies to try to reduce the risk to the public at large. The State guidelines for the preparation of the Seismic Safety Element, which clarify the State mandate to adopt the Element, requires government agencies to specify the level or nature of acceptable risk to life or property.

A risk analysis for land use planning should include an evaluation of the general geology and seismology of the area, the geological characteristics of the specific site, the use of the land, and the specifications of the particular structure(s) proposed. The analysis should ascertain the risk to human life and limb, the risk to property, and the risk to social and economic disruption. Ideally, it would be desirable to be able to quantify each of the categories stated above. Unfortunately, the state of the art in the fields of geology, seismology, and engineering is not so advanced that it is possible to arrive at a figure that represents the total risk.

Legal Issues

Legal issues have been considered in the drafting of the policy statements contained in the Element. To be upheld in court, any land use regulation must be reasonable both on its face and as applied to a particular situation. The reason for regulating potential seismic hazard areas is to minimize the threat of danger to public health and safety. Public health and safety includes the prevention of dangerous conditions on one property from affecting another and the reduction of risks to the individual. While there is little legal precedent to reference specifically in the area of seismic hazard regulation, it is felt that Claremont's policies are within the proper scope of legislative action, are an appropriate means of achieving the goal of reducing seismic risk, and are reasonable in the light of the technical information available.

Economic and Social Implications

The economic and social implications of the policies are difficult to assess in that they, like the concept of risk, are not easily subject to quantification. The policies for minimizing seismic hazards are intended to strike a balance between additional burdens placed upon the property owner and those placed upon the community as a whole.

It is acknowledged that reducing seismic risk often results in higher costs. These costs may come in varying forms such as additional reports prepared by specialists, lower densities, or more demanding building requirements. For communities that are still growing, the protection of new development is the best way

to reduce risk. Cities which have a larger concentration of older buildings would be best to concentrate on reducing the known existing risks. Claremont is in the position of having to consider the impact that its policies have on both new developments and its existing pre-1933 structures.

Policies

Geologic and Seismic Hazards

Risk management areas shall be established so that the City may make a more informed evaluation of the development potential of the property within these areas. The following risk management areas shall be created:

1. Landslide Hazard Management Area -

incorporates all of the hillside area as designated on the geotechnic map.

2. Earthquake Hazard Management Area -

includes all of the property in the flat part of the City.

All developments within the Landslide Hazard Management Area shall be required to submit a combination of design analysis and soil reports, and a review of potential landslide hazards that might exist if the development proceeds to the City for review and approval prior to processing other applications. The City will be required to make a determination that an undue hazard would not result from construction on the subject property prior to issuing a building permit.

Those persons intending to develop a major facility within the Earthquake Management Area, such as critical public buildings, critical utility structures, and high occupancy or high-rise (over three stories or 40 feet) uses shall be required to submit a design analysis as well as soils, geologic, and seismic reports to the City to indicate that an undue hazard does not exist or would not result from construction on the property. These technical reports should also address any potential or known problems relating to ground water hazards either from known cienegas or other areas that have experienced surface water flow.

The City should attempt to establish an agreement with the appropriate County departments for them to require design analysis, soils, geologic, and seismic reports for property within the Management Areas that are located in the unincorporated area, and to adopt similar development policies.

Disaster Planning

For a community that is as fully developed as Claremont, one of the most significant aspects of seismic hazard, which can be adequately planned in advance, is a coordinated disaster plan which involves all governmental and non-governmental agencies with the capacity to save lives and minimize damage. A coordinated system with the surrounding cities, the County, the State, and the Federal governments shall be established to the extent possible.

As part of the implementation phase, the City shall review the current Emergency Plan (October, 1972), evaluate its adequacy with regard to potential seismic hazards, and revise the plan as necessary. This review shall be conducted in close cooperation with the utility companies to insure that the possibility of earth movement shall be considered in the design and installation of utilities throughout the city.

Disaster planning shall also include a thorough review of the City's communications system including a program for utilization of the knowledge and communications equipment owned by private citizens.

Structural Hazards, Private and Public

One of the most difficult policy decisions to be made in the area of reducing the risk of seismic hazard has to do with the abatement of structural hazards in private buildings. Ground shaking is considered to be the most probable factor in terms of potential building damage and life loss within the City. The failure of unreinforced masonry, parapets, other types of ornamentation, ceilings, and roofs causes the most serious damage. This particular hazard cannot be avoided through land use control, but rather must be dealt with through the adoption and enforcement of appropriate building code provisions and through the abatement of existing hazards.

There are many economic and social implications that must be considered. The risks of loss of life and property damage must be weighed against the possible effects of economic deterioration. Those buildings which are determined to be extremely likely to lead to loss of life in an earthquake should be made structurally safe at the earliest possible date. Further study will be necessary to make this determination.

The City shall develop an equitable hazard abatement program for those structures which are determined to be structurally hazardous by State licensed experts. The abatement program shall consist of alternative approaches to mitigating hazards including various degrees of rehabilitation, possible changes of use or occupancy, and, in the most extreme situations, condemnation.

Following a disaster, public buildings have an important function that may not necessarily be related to their normal use. Often they can serve as refuge areas, as rallying points and as distribution centers for emergency supplies. Certain

facilities, such as City Halls and police and fire stations, contain the vital governmental functions necessary to coordinate disaster relief activities. Fire hazard is extremely important in earthquakes. In order to make men and equipment available for fighting fires and helping in other emergencies after an earthquake, it is necessary to have structurally sound facilities available. Potential structural hazards in existing public buildings shall be mitigated or abated at the earliest possible opportunity.

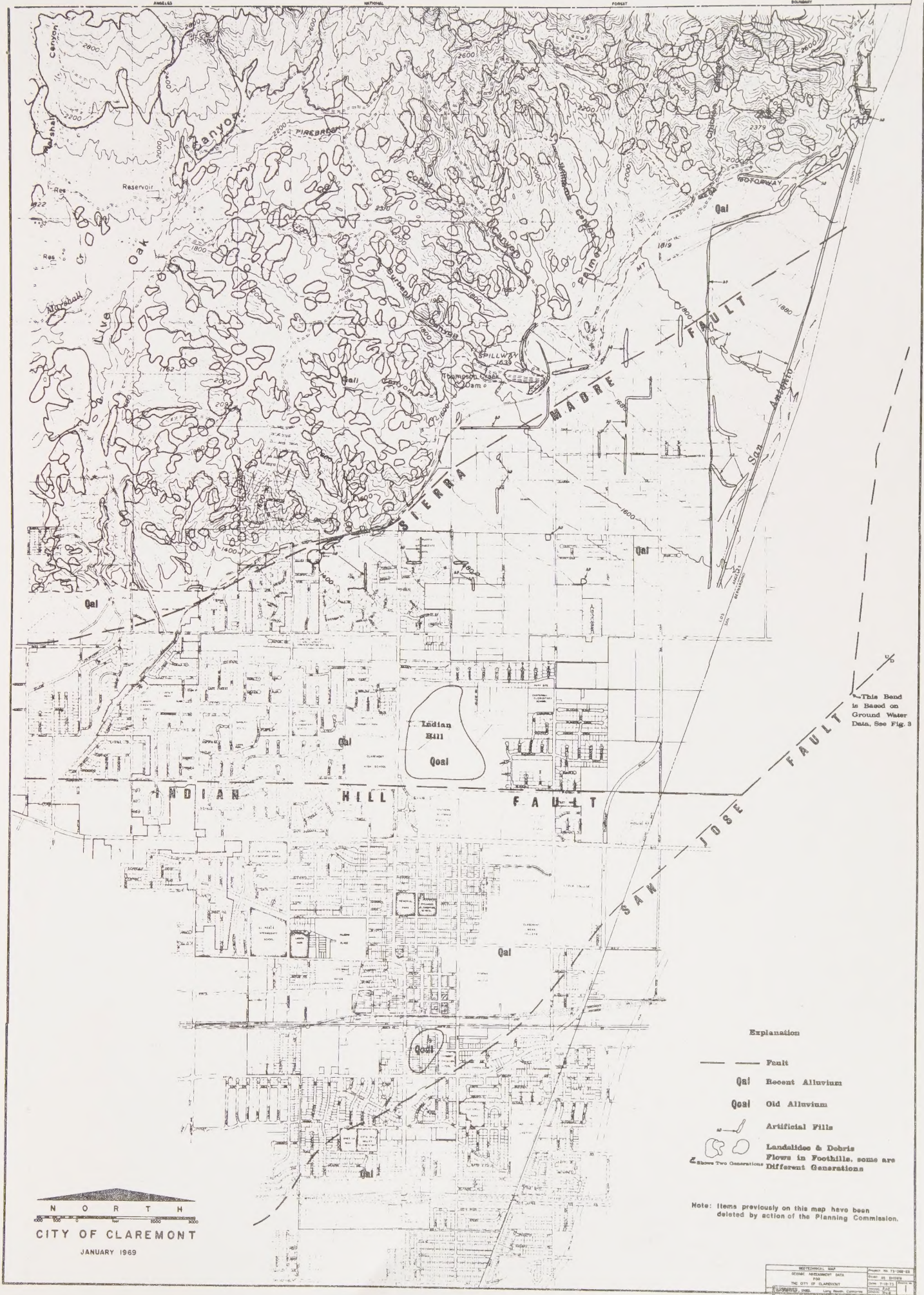
Building Code Requirements

Post earthquake investigations have revealed a significant relationship between building code requirements and the risk of personal injury and/or property damage. Since 1933 when seismic design was first incorporated into the building code, knowledge in this area has steadily been improved and refined. The most significant changes have been in the area of designing structures to withstand earthquake forces proportional to their masses. Further improvements are yet forthcoming, particularly in the area of determining the dynamic response of buildings.

The City shall encourage study which is aimed at improving the present state of earthquake technology with regard to building design. Amendments to the Los Angeles County Building Code which will implement the policies stated in the Element and which will further reduce earthquake generated hazards associated with structures should be adopted by the City.

Annual Review

The Seismic Safety Element shall be reviewed on an annual basis by the Planning Commission to evaluate the technical adequacy of the Element as it relates to soils, geologic, and seismic reports conducted for the Southern California area in general and the City of Claremont in particular, building code revisions, and structural hazards surveys conducted by the City and other qualified sources.



This Bend
is Based on
Ground Water
Data, See Fig. 3

Explanation

- Fault
- Qal Recent Alluvium
- Qol Old Alluvium
- Artificial Fills
- Landslides & Debris Flows in Foothills, some are Different Generations

Note: Items previously on this map have been deleted by action of the Planning Commission.



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JANUARY 1969

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